

Demonstration of Fiber Reinforced Polymer Composite Bridge Decking as a Replacement for Deteriorated Steel Reinforced Concrete Bridge Decking

FY09 Army Facilities CPC Project
F09AR16

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US Army Corps of Engineers
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Outline

- Background / Problem
- Composite System Designs / Advantages
- Deck Replacement Demonstration Project
- Load Testing
- Material Performance Testing
- Comparison with Recently Replaced Concrete Deck
- Conclusions to Date



The Problem

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and traffic disruption



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The Solution

Fiber Reinforced Polymer Composite Bridge Decks Offer Promising Solution:

- Do not corrode / degrade like concrete & steel
- Low maintenance for estimated 75 years
- Lighter in weight means reduced dead load and increased dynamic live load capacity
- Reduced construction time
- Reduced duration for traffic disruption
- Higher material costs offset by reduced labor to install



Replacement of Deteriorated Concrete Deck at Redstone Arsenal, AL



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Materials Degradation on Bridge #18 at Redstone Arsenal, AL



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Materials Degradation on Bridge #18 at Redstone Arsenal, AL



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Materials Degradation on Bridge #18 at Redstone Arsenal, AL



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Demolition of Concrete Deck



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Installation of FRP Composite Replacement Deck



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Installation of FRP Composite Replacement Deck



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Installation of FRP Composite Replacement Deck



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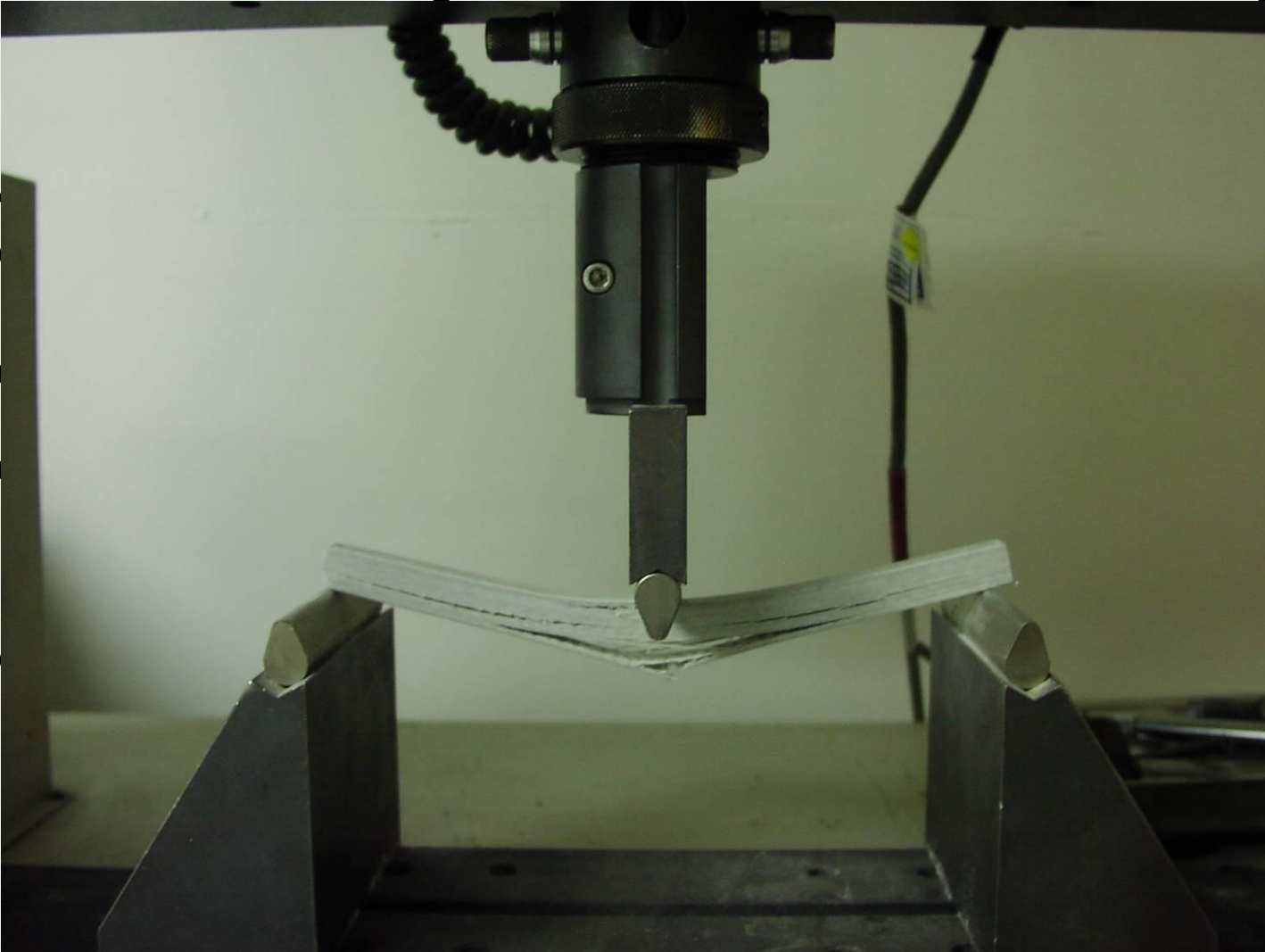
Installation of FRP Composite Replacement Deck

- After guard railings, apply a polymer concrete wear surface on top of composite deck panels
- Conduct load testing for HS-20 rating
- Add markings and ready to open up to traffic



Laboratory Materials Testing

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Condition of Recently Replaced Reinforced Concrete Bridge Decks at Redstone Arsenal



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Conclusions

- Need to continue performance monitoring for at least two years
- Need to develop cost data and expected Return on Investment based on the actual costs of implementation
- Develop engineering standards to enable use by the Army and the other Services



Questions ???

